# Amish Sethi

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## EDUCATION

**University of Pennsylvania**                                                                                  Philadelphia, Pennsylvania
Senior – Computer Science (B.S.E. and M.S.E., Accelerated Master's Program)            **Graduating: May 2026**
Cumulative GPA: 4.00/4.00
**Pine-Richland High School**                                                                                         Gibsonia, Pennsylvania
Cumulative GPA: 4.00/4.00                                                                                          **Graduated: June 2022**

## RESEARCH EXPERIENCE

**In Context Learning of VLA with Human Video**                                                       **May 2025 – Present**
*Research Mentors:* Mayur Naik, Dinesh Jayaraman                          *Institution:* University of Pennsylvania
- Enabling Vision-Language-Action (VLA) models to learn robot policies from human demonstration videos without expensive teleoperation data by leveraging scene graph representations as structured supervision signals
- Working hands-on with a Franka robotic arm conducting experiments on training $\pi_{0.5}$ to generalize with ICL

*Planned Submission:* Amish Sethi*, Jiani Huang*, Felix Zheng*, Brandon Yang, Chris Watson, Aurora Qian, Junyao Shi, Mayur Naik, Dinesh Jayaraman. In Context Learning of VLAs with Human Videos. Aim for CVPR 2026.

**Delta Activations: A Representation for Finetuned Large Language Models**            **January 2025 – Present**
*Research Mentors:* Mayur Naik, Ser-Nam Lim                                 *Institution:* University of Pennsylvania
- Developed method to represent finetuned language models by measuring shifts in internal activations relative to a base model, enabling model retrieval and embeddings for understanding finetuning effects
- Demonstrated models cluster cleanly by domain in existing hubs and enabled task-based retrieval of specialized models through few-shot embedding
- Led all experimental validation across multiple model families; finetuned and released over 700 open-source models on Hugging Face to facilitate community research in building reliable model ecosystems

*Under Review:* Zhiqiu Xu*, Amish Sethi*, Mayur Naik, Ser-Nam Lim. Delta Activations: A Representation for Finetuned Large Language Models.

**ESCA: Contextualizing Embodied Agents via Scene-Graph Generation**                   **January 2024 – Present**
*Research Mentor:* Mayur Naik, Ser-Nam Lim                                 *Institution:* University of Pennsylvania
- Co-led development of VINE, a foundation model extracting spatio-temporal scene graphs from video
- Developed transfer protocols and finetuning pipelines demonstrating ESCA improves success rates up to 10% across multiple vision-language models on the EmbodiedBench benchmark

*Publication:* Jiani Huang*, Amish Sethi*, Matthew Kuo*, Mayank Keoliya, Neelay Velingker, JungHo Jung, Ziyang Li, Ser-Nam Lim, Mayur Naik. ESCA: Contextualizing Embodied Agents via Scene-Graph Generation. Accepted into NeurIPS 2025. ***Spotlight Paper (top 3% of 20,000+ submissions)***.

**Dolphin: A Programmable Framework for Scalable Neurosymbolic Learning**         **August 2024 – July 2025**
*Research Mentors:* Mayur Naik, Eric Wong, Saikat Dutta                    *Institution:* University of Pennsylvania
- Addressed performance bottlenecks in neurosymbolic frameworks by developing CPU-GPU hybrid execution strategy partitioning symbolic manipulations on CPU while vectorizing probabilistic computations on GPU
- Optimized map-reduce operations by implementing memory-efficient reductions eliminating unnecessary intermediate tensors while maintaining end-to-end differentiability
- Demonstrated $1.7\times$ to $62\times$ speedups across 13 benchmarks, achieving state-of-the-art accuracy on tasks where existing frameworks failed to converge or exhausted GPU memory

*Publication:* Aaditya Naik, Jason Liu, Claire Wang, Amish Sethi, Saikat Dutta, Mayur Naik, Eric Wong. Dolphin: A Programmable Framework for Scalable Neurosymbolic Learning. ICML 2025. 3 citations.

**CLAM: Unifying Finetuning, Quantization, and Pruning**                                         **January 2024 – June 2024**
*Research Mentors:* Mayur Naik, Eric Wong, Saikat Dutta                    *Institution:* University of Pennsylvania
- Developed framework unifying parameter-efficient finetuning, quantization, and pruning for LLMs by reformulating optimization techniques as weight-based adaptations, enabling unlimited chaining of previously incompatible methods
- As lead developer and primary codebase contributor, demonstrated CLAM compositions match uncompressed models while using 86% fewer bits

*Publication:* Neelay Velingker, Amish Sethi*, Jason Liu*, William Dodds*, Zhiqiu Xu, Saikat Dutta, Mayur Naik, Eric Wong. CLAM: Unifying Finetuning, Quantization, and Pruning by Chaining LLM Adapter Modules. ICML ES-FoMo

2024. 1 citation.

**FIIGNET: Synthetic Data for Aquaponics**                    **May 2023 – August 2023**

*Research Mentors:* Kelvin Fong                    *Institution:* National University of Singapore

- Created generative AI pipeline (FIIGNET) using PyTorch to synthesize images of fish with specified diseases for training early detection models in aquaponics systems
- Trained models on synthetic and real datasets, with FIIGNET improving disease detection accuracy by 17%
- Presented research paper and poster at SERIUS program at National University of Singapore

**Functional genetic biomarkers of Alzheimer's Disease**                    **November 2019 – January 2021**

*Institution:* University of Pittsburgh

- Utilized machine learning, clustering, and dimensionality reduction algorithms in scikit-learn to identify genes expressed differently between Alzheimer's patients and control groups
- Developed predictive model achieving 98% accuracy in determining likelihood of Alzheimer's based on gene expression values from peripheral blood

*Publication:* Amish Sethi*, Andrew Ni*, and Alzheimer's Disease Neuroimaging Initiative. Functional genetic biomarkers of alzheimer's disease and gene expression from peripheral blood. BioRxiv. 2021. 8 citations.

## WORK EXPERIENCE

**Best in Grass** | Remote Machine Learning Intern                    **December 2024 – December 2025**

- Built large-scale structured dataset by extracting terpene and cannabinoid profiles from unstructured PDFs using cutting-edge vision-language models (table-transformer, InternVL)
- Applied supervised learning and clustering methods to map chemical compositions to user-reported effects
- Developed strain-effect prediction pipeline used for product recommendation systems

**Roadbotics** | Computer Vision Intern | Pittsburgh, PA                    **June 2021 – August 2021**

- Used computer vision in TensorFlow to detect, classify, and locate traffic signs from input video
- Developed Mask-RCNN deep neural network achieving 90% accuracy in detecting traffic signs
- Model deployed by Pennsylvania state government to maintain inventory of road assets

## MENTORSHIP AND ACADEMIC SERVICE

**Head Teaching Assistant, CIS 7000: Large Language Models**                    **Fall 2024**

University of Pennsylvania

- Served as Head TA for Penn's first dedicated LLM course with 120+ students, covering theory, design, training, compression, deployment, and application of large language models
- Planned course curriculum, designed homework assignments, held office hours, and created lecture slide decks
- Delivered lectures on efficient finetuning, adaptation, and evaluation; course received TA quality rating of 3.15/4 and overall quality rating of 3.01/4

**Undergraduate Research Mentor, Penn PURM Program**                    **Summer 2024**

- Mentored five undergraduate students on the CLAM project, teaching research methodology in machine learning, working with LLMs, and developing scalable optimization frameworks

**Grant for Faculty Mentoring Undergraduate Research (GfFMUR)**                    **December 2024**

- Authored successful proposal awarded $8,000 by University of Pennsylvania to fund undergraduate research mentorship on neurosymbolic AI

**Peer Reviewer**

- ICML 2024 ES-FoMO Workshop, AAAI 2026, ICLR 2026

## HONORS AND AWARDS

- NeurIPS 2025 Spotlight Paper for ESCA paper (top 3% of 20,000+ submissions)
- First Place, International Public Policy Forum (IPPF) (2022)
- ISEF (International Science and Engineering Fair) Finalist – Genetics Research Project (2021)
- Verbal Commendation, Harvard National Model United Nations (2023)
- First Place Programming Award, FIRST Tech Challenge Pennsylvania State Championship (2022)
- Second Place, FIRST Tech Challenge World Championship (2022)

**GitHub:** https://github.com/AmishSethi, https://github.com/ASethi04

**Website:** https://amishsethi.github.io/personal-website/